



TV ANYWHERE

James Middleton explains how 3G mobile technology makes watching TV on the go possible – so you won't have to miss a minute of the action in the World Cup

With the World Cup just around the corner, you may already be checking the fixtures list and planning how and where you can watch the games. But now third-generation (3G) mobile technology is finally taking off in the UK, you should be able to catch the live action from anywhere.

Depending on how much you believe the hype, you are probably either sceptical or awed about the wondrous things 3G promises it can deliver, and we all know that mobile operators are constantly on the lookout for new data services that are easy to understand. However, with mobile TV they may have found the Holy Grail: television on your mobile is a concept everyone understands.

It is only recently that 3G has started to gather momentum, despite all the hype surrounding it. By now, you are probably quite familiar with the term '3G' and the kind of handsets and services that mobile operators have been touting as the next big thing.

In fact, you may already own a 3G phone, given that 3G contracts are estimated to have

accounted for a third of Europe's total new mobile subscriptions in the last three months of 2005. This still means that at the end of 2005, only six per cent of Europeans had a 3G phone, but interest is increasing. Now cheaper and more feature-rich handsets are available, three in five mobile subscribers are expected to have migrated to 3G by 2010.

STAND AND DELIVER

With the faster speeds offered by 3G, the technology has a huge role to play in the delivery of content and services such as mobile TV. At present, 3G is one of the key delivery mechanisms for TV to your mobile handset, and because the 3G networks are still far from filled with traffic, you can benefit from uncongested data streams, which means applications such as streaming mobile TV should run smoothly.

However, mobile operators are anticipating furious future growth of mobile television services, so 3G networks are likely to be superseded by broadcast technologies, maybe as early as this year, which will be used to deliver TV to mobile phones.

In this article we take a look at mobile TV and explore how existing and future technologies such as mobile handsets and notebooks will allow you to get TV anywhere.

THE TV GOLD RUSH

To date, only three of the UK's big five mobile operators have launched services allowing you to watch TV on your mobile phone: Vodafone, Orange and 3. All of them use the same model of streaming mobile TV content direct to the handset using their 3G networks.

Vodafone's mobile TV service allows all Vodafone live! subscribers with a 3G handset to access globally sourced content from Sky. Orange and 3 have launched almost identical offerings using the third-party MobiTV platform, which offers hour-long excerpts of looped content from a variety of channels for a monthly subscription of £10.

T-Mobile intends to launch its own 3G-based TV in Your Pocket service in time for the World Cup. As the company is one of the sponsors of the event, it is planning to stream live matches to customers' handsets.



Streaming TV v broadcast TV The battle to deliver mobile broadcasting

STREAMING TV

Streaming TV is probably familiar to most people because of its similarities to internet TV, or IP TV. In the mobile world, 3G-based unicast services are ideal for the initial mobile TV market as the mobile operators' existing 3G network coverage, capacity and handsets can be used.

The nature of 3G-based unicast services means that every time you connect to a mobile TV channel, you open a dedicated connection between the handset and the server, which allows you to pause the programme, rewind and so forth. This technology is being used to supply TV-on-demand services over mobile. Rather than a live TV stream, these contain prepackaged content that runs for a certain time, such as music videos or sports clips.

The main concern with a mobile TV offering over 3G is that it would consume the network's bandwidth and is a very inefficient use of spectrum. An upcoming answer is to use a multimedia broadcast and multicast service (MBMS) implemented over 3G, such as the TDtv technology being promoted by Orange. MBMS allows 3G operators to offer subscribers mobile TV packages without impacting other voice and data 3G services.

Multicasting allows an infinite number of customers to watch the same channel or use the same network bandwidth by copying the content at the network end and delivering it to as many viewers as required.

Multicast technology is already being used in traditional internet TV with some success, particularly now that most internet users have broadband, but it can also be used to transmit streaming TV over WiFi, and potentially over WiMAX wireless broadband when the technology becomes commonly available.

BROADCAST TV

Broadcast TV is another concept you will be familiar with. It is the same technology used to deliver TV over radio waves to your home. Analogue terrestrial broadcast TV tuners, which would allow you to get the same services as you get on your home TV at present, have been introduced on mobile handsets in Asia. But there is little point in introducing them in the UK, which plans to switch off analogue TV in 2010.

As a result, the main focus is on digital TV services, with a number of specifications emerging as front runners. Mobile operators are reluctant to adopt terrestrial digital TV, however, as this would leave them out of the revenue loop.

Digital Video Broadcast to Handheld (DVB-H) is the current favourite after being named the European mobile TV standard by the European Telecommunications Standards Institute (ETSI) in 2004, and receiving heavy backing from the likes of Nokia. DVB-H is based on datacasting technology, the delivery of digital content over radio waves. It offers a downstream channel at high data rates as well

as time-slicing technology, which is designed to reduce power consumption in small handheld terminals. The receiver is on only while the data burst of a selected service is on air, allowing significant power saving.

The biggest obstacle for DVB-H is that it uses the Ultra High Frequency (UHF) spectrum, which at present is unavailable for mobile TV until analogue TV is switched off in 2010.

Terrestrial Digital Multimedia Broadcasting (T-DMB) has certain similarities to DVB-H as well as DAB, but at present it is used only in South Korea. The technology is being promoted in Germany at present, with the country anticipating a launch of T-DMB mobile TV services in time for the World Cup. It is likely that it will be similar to that being championed by BT and Virgin Mobile in the UK, which is based on digital audio broadcasting (DAB).

DAB is most familiar as the digital radio medium, but it is also capable of carrying data, in this case, mobile TV programmes. DAB's big advantage is that a nationwide network already exists, and DAB-capable handsets will also be able to pick up all the digital radio channels. DAB was developed specifically for mobile receivers, while DAB, DMB and DAB-IP all share the same infrastructure, spectrum, transmission protocol and receiver components, which gives the technology flexibility, speed and economy of scale.

Mobile TV is still very much in its infancy, and the current incarnation of the technology via the Orange and 3 networks is limited by the fact that it works on only three handsets at present: Nokia's 6630, 6680 and N70. It also requires the download of an application. Vodafone's offering has a more integrated feel about it and works on any 3G handset with Vodafone live! access.

But broadcast TV is also stirring up a great deal of interest in the industry. The problem with streaming TV over a 3G network is that each user requires a dedicated amount of bandwidth, so as these 3G networks fill up, mobile TV services might slow down or become congested by TV viewers. By using a broadcast medium, as television companies do with terrestrial TV today, the operator can target many devices with the signal. This is where the incumbent fixed-line carrier, BT, has got in on the act, going straight for digital broadcast TV using the UK's nationwide Digital Audio Broadcast (DAB) network, which is currently used to transmit digital radio.

VIRGIN TERRITORY

Just last month, Richard Branson's mobile virtual network operator (MVNO), Virgin Mobile, became the first company to sign up to BT's mobile TV service, which BT is calling Livetime. Virgin Mobile is now piloting the service for a four-month trial in the M25

region, and plans to make the offering available to the mass market later this year. Incidentally, the live TV rights to the World Cup are shared between ITV and the BBC, both of which worked with Virgin Mobile on its trial of mobile TV.

The Virgin service will be available on the HTC-developed, DAB-IP-enabled smartphone called Trilogy and will initially provide access to Sky Sports News, Sky News and Blaze, a music channel designed specifically for mobiles. Virgin Mobile TV will also eventually let customers record programs.

However, digital broadcast TV is not the only next-generation technology in the running to be your mobile TV platform of choice. A US vendor called IPWireless recently

announced that Orange UK would be the first operator to trial its TDtv mobile TV and multimedia offering, launching a technical trial in the country in mid-2006. TDtv also uses the operator's existing 3G spectrum but in a more efficient manner.

O₂, meanwhile, is championing Digital Video Broadcast to Handset (DVB-H), and last year partnered with NTL Broadcast to trial the service to 350 customers in the UK. Channels available on the O₂ service include the Cartoon Network, Discovery Channel and CNN.

THE STANDARDS WAR

Nokia, one of the driving forces in the development of mobile TV, has said that mobile TV presents a number of unique challenges, such as battery-powered receivers and environmental effects, including use indoors and in moving vehicles.

The general consensus among the mobile operator and vendor community appears to be that while mobile TV is going to be popular, streaming it over a 3G network is not the best way to do it. The end-user is restricted to watching streamed mobile TV only in areas of 3G coverage, which at present means only the most populous cities of the UK.

But while DAB is seen by some as a more efficient delivery technology for digital TV, a claim based largely on the platform's success for digital radio broadcasting and the existence of a nationwide network, much interest is being placed in the Nokia-backed DVB-H technology. To overcome the aforementioned challenges,



▲ 3G handsets such as Nokia's N70 are already capable of receiving streaming TV content



DVB-H uses time slicing to reduce a device's power consumption, cell identifiers to support quicker signal scan and frequency handover as well as methods to improve signal strength.

Support for the DVB-H mobile TV standard is strong. At the end of 2004, the European Telecommunications Standards Institute (ETSI) announced that the DVB-H specification was to be adopted as the European standard for mobile TV services. Last year, Nokia launched its first commercial mobile TV handset with integrated DVB-H technology, the N92, anticipating that standardisation work will be completed within two to five years.

But the biggest obstacle is the fact that the Ultra High Frequency (UHF) spectrum – the band of choice for DVB-H – is unavailable for mobile TV in most countries. It will not become available until analogue TV is switched off, which in the UK is scheduled for 2010. However, some versions of DVB-H are known to operate in the telecoms-regulated S-band, where spectrum is still available. Just to add more confusion, Germany said this month that it will be trialling South Korea's digital multimedia broadcasting (DMB) technology in Hanover, to promote the Asian mobile broadcasting standard prior to the kick-off of the World Cup finals in the country.

It is this lack of consensus on an industry standard that is holding up the development of mobile TV, according to the industry analyst Forrester. It believes mobile broadcast TV in most European countries is still a couple of years away and, in the meantime, mobile operators will focus on making the most of streaming TV.

GETTING INTERACTIVE

Part of the attraction of the advanced viewing services offered by mobile TV is the opportunity to build in enhanced features. There is ample opportunity for interactivity with mobile TV. Forrester believes that operators and service providers will focus heavily on this interactivity, and we can expect to see features such as voting and chat around TV programmes with a single click from the offset.

Research from Ericsson claims that a trial of interactive mobile TV, which allowed users to vote, chat and communicate with a television presenter while watching the show on their handset, doubled the average viewing time for TV on a mobile handset.

THE PRICE TO PAY

The idea of broadcast TV to your mobile implies that you should be able to tune into existing TV

The other mobile technology TV on your PC

While it is evident that mobile TV is an up-and-coming technology, we must not forget existing TV platforms – the predecessors of mobile TV – which by rights should also be acknowledged as having some degree of mobility.

TV tuners for notebooks have been around for years now and are probably the cheapest way of viewing TV programmes on a non-standard device such as a notebook. You can pick up a USB-attached box for your notebook for around £50 these days – not forgetting your television licence fee, of course. However, to get a decent picture you need to be in an area with good TV reception, which is guaranteed everywhere you're likely to travel.

There is arguably a cheaper and more convenient way to get TV than the old standby terrestrial broadcast method, and that is internet TV. A number of service providers, such as Telewest, are currently trialling internet TV services. But again, the technology is quite immature, although it is highly likely that you will be able to watch World Cup matches streamed live over the internet, and this includes sitting in a café or

hotel room with your notebook and a WiFi connection.

Developing technologies in internet TV are also becoming popular, with WiMAX, the fledgling wireless broadband technology, getting a lot of attention. Regional WiMAX provider Telabria and BBC Bristol last September conducted the UK's first live television broadcast over WiMAX-class wireless broadband technology. The broadcast achieved a 20Mbit/s bi-directional link, which is more than enough bandwidth to transmit and receive TV services. Telabria believes that WiMAX radios will begin to ship on notebooks within the next few years.



▲ A USB tuner is the cheapest way to get TV on your notebook

stations and not have to pay. You still have to pay your TV licence fee, but allowing access to terrestrial TV stations is something mobile operators are loathe to do as they would cut themselves out of the revenue loop. Mobile operators would much prefer to charge you for access to their content, or take a cut of the revenues of their partners'.

In January this year, BT unveiled the results from its pilot of mobile digital TV and claimed that 73 per cent of customers taking part in the trial would be prepared to pay up to £8 per month for the service if it was available on their current network. Furthermore, 38 per cent would be prepared to switch networks to receive the service.

Likewise, research from Nokia's mobile TV trials suggests that the most popular pricing model to emerge is a monthly subscription for a package of channels with a majority of testers in Europe willing to pay between €7 and €10 (between £5 and £7) per month for mobile TV services.

O₂ also said that 83 per cent of participants involved in its trial in Oxford were satisfied with the service and over three-quarters said they would take up the service within 12 months of it becoming available.

One revelation that cropped up in a number of pilots was that many people watched mobile TV at home, suggesting that users have been adopting the mobile phone as another TV screen in the home and perhaps indicating more demand than just a way to spend a few idle moments when away from home.

It appears that mobile TV services won't be available for free any time soon, but moving to a broadcast model should immediately be cheaper than paying to download streamed shows by the megabyte. 3G-streaming TV services seem clunky, and it's obvious that they have mere fledgling status, but with the amount of hype and effort operators are putting into mobile TV at present, we may well have some more advanced broadcast offerings to take advantage of before the kick-off on 9th June. ☐

Streaming mobile TV services currently available

Operator	Compatible handsets	Price	Channels/packages
Vodafone with Sky Mobile TV	Any 3G phone on the Vodafone network	£5 per month for either Sky Mobile package, £3 per month for the variety pack, all three for £10 per month	Sky News and Sports pack includes Sky News, Sky Sports News, Discovery, CNN, At The Races, Bloomberg, History Channel and National Geographic. Sky Music and Entertainment pack includes Sky One, MTV, Cartoon Network, Bravo, Living TV, Nickelodeon, Sky Movies, Discovery, Comedy Channel and Biography Channel. Variety pack includes Fashion TV, Chilli TV, Eurosport, UEFA Champions League, Channel 4 and HBO
Orange TV	Nokia 6630 Nokia 6680 Nokia N70	£10 per month for 1GB data, 50p per MB thereafter	CNN, ITN, Cartoon Network, Extreme, Maxx Sports, Bravo, Kiss, Smash Hits, Living TV, GMTV, ITN Weather, Channel 4, Comedy Time, Fashion TV, Shorts TV, Mobi Trailers, iFilm, Bloomberg, Kerrang!, ToonWorld TV
3 MobiTV	Nokia 6630 Nokia 6680 Nokia N70	£10 per month for 'reasonable usage'	CNN, ITN, Cartoon Network, Extreme, Maxx Sports, Bravo, Kiss, Smash Hits, Living TV, GMTV, ITN Weather, Channel 4, Comedy Time, Fashion TV, Shorts TV, Mobi Trailers, iFilm, Bloomberg, Kerrang!, ToonWorld TV